

# **The Prospect of Coal Supplier for Future Coal: Major Expansion of Energy Supply/Demand in Indonesia**

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## **Abstract**

Since the mid 1980s Indonesia's coal industry has shown a high development growth both of production and coal sales. The majority of coal producers are located in Sumatra and Kalimantan islands and the majority of domestic coal consumers are located in Java islands, while the major Indonesian coal exporters are Asia-Pacific countries (80%). In the future (up to 2003) there will be more domestic and export potential demand which will increase at the average of 2-3 million tons per annum (15%) and 5-7 million tons per annum (11%) respectively. This demand must be anticipated by all Indonesian coal players as well as the government, which act as the principle of the players.

## **Introduction**

After the first oil shock in 1970s and 1980s, the importance of coal was reviewed and price competitiveness of coal set to be improved. This was then followed by the government policy to diversify energy resources and put coal as a main alternative energy both as an export commodity and as domestic primary energy. As a result, the first coal-fired power plant (4 x 400 MW and 3 x 600 MW) was built gradually (1985-1997) at Suralaya, West Java. Beside that, coal was also introduced to the industrial sector such as the cement, small industries, and so on as a supply of heat.

The success of government to develop the coal industry was figured by the rapid growth of coal production, which was about 0.6 million ton per annum in 1983 and became 73.6 million tons per annum in 1999, or around 37% average. Production of coal has increased every year. The domestic consumption also increased from about 0.2 million tons in 1983 to 18.4 million tons in 1999. While export increased from about 0.4 million ton in 1983 to 55.2 million tons in 1999.

This paper will describe the prospect of Indonesian coal supplier to maintain the availability of coal supply and demand, the role of Indonesian government in this development and some issues on coal related supply and demand.

## **Coal Development**

Since 1980s, Indonesia's coal has become more and more important in playing a key role in fulfilling national energy need and in improving regional energy security. Shortly speaking, Indonesia hopes to maintain the dual role in the coal sector both as a key energy supplier to the domestic market and as a coal exporter especially to the internationally traded thermal coal market. This will provide benefits to the nation in term of both providing a reliable supply of domestic source energy and valuable export earnings. As such, fulfilling the needs of export and domestic

customers are considered to be equally important.

The above are essentially supported by:

- majority of the Indonesian coal resources are characterized by of 2-3 meters thick seams across substantial areas and generally is deposited close to the surface of shallow sedimentary basins, which leads to easily mined by an open pit mining method;
- the availability of world class coal mining operator;
- relatively attractive coal quality and environmentally-friendly coal;
- infrastructure especially coal terminal.

On the contrary, over 58% of Indonesia's coal is classified as a low rank (lignite) coal with relatively high moisture content and low calorific values, while sub-bituminous and bituminous contribute to only 26% and 14% of the total resource. It is realized that there will be smaller demand for lignite compared to sub-bituminous and bituminous. As a result, pressing by coal demand and market price mechanism, Indonesia's coal producers will prefer selling the low rank coal (lignite or sub-bituminous) to the domestic market and exporting the higher rank coal (bituminous and anthracite). During 1997-1998, when political and economical crisis hit Asia mainly Indonesia, the impacts also affected the coal sector. Some coal consumers have to reduce their consumption which then influenced the demand projection. Therefore, some of coal exploration players withdrew and postponed the activities.

Regarding coal production and demand, the period of 1980s and 1990s, Indonesia experienced very rapid coal production growth by around 37% a year. Among the commercial energy usage, coal was recorded as the first highest average annual growth rate. The energy mix coal contributed 9.9% (FY 1998/1999) and the power sector coal contributed 33.7% in 1998 (Figure 1 and 2).

## **Current and Future Prospect**

### **Coal Players' Status**

Coal is still a very attractive product, which is demonstrated by a big interest of investors (Table 1). All investors regardless of nationality, will be able to invest in the coal sector. With this spirit, there are presently four groups of coal producers in Indonesia, namely the state-owned coal company (PTBA), Coal Contract of Work/CCoW (Generation I, II, and III), Mining Authorization holders (MA or Kuasa Pertambangan: KP) and cooperative units (Koperasi Unit Desa; KUD's). The present major producers are the First Generation of CCoW (10 companies), PTBA and Second Generation of CCoW (5 companies).

PTBA is an only state-owned company of the coal mining sector. PTBA operates two coal-mining areas located in Ombilin (Central Sumatra) and Tanjung Enim (South Sumatra). PTBA contributes about 16% of the total national coal production (about 11.2 Mt) and most of its production (50%) go to Indonesia's largest power plant at Suralaya (West Java) and the rests (2.24 Mt in 1999) are for export.

The Second Generation of CCoW consists of 17 companies. They are all entirely under a domestic investment scheme. Five themes have already been in operation, which are PT Bahari Cakrawala Sebuk (production capacity 1.5 million tons), PT Bentala Coal Mining (300,000 tons), PT Antang Gunung Meratus (300,000 tons), and PT Jorong Barutama Greston (500,000 tons), all in South Kalimantan and PT Gunung Bayan Pratama Coal (1.5 million tons) in East Kalimantan.

The status of present Third Generation of CCoW are 2 contractors in feasibility study, 30 contractors in exploration stage and 60 contractors in a general survey. In total, eight of them are

under the foreign investment scheme. Some Third Generation contractors are very active and will come into production within 2002-2010. Some others have been withdrawn (15 companies) due to not being able to find coal reserves and others are suspension due to financial reasons such as a lack of investment. The problem of this Generation III of CCoW may include discovery of low rank or low quality coal, which is not attractive at present. Some others are located remote areas, which need assistance to develop infrastructure.

## **Coal Production, Domestic Demand, and Export**

Indonesian coal demand comes from both domestic and abroad. The domestic demand is mainly the electricity and cement sector. By considering companies planning, consumption pattern trend, the coal production, domestic and export demand will continue to grow (Table 2). Electricity will be still a dominant domestic coal consumer followed by the cement industry.

### **Coal Production**

During the period of 1980s to 1990s, Indonesia experienced a very rapid coal production growth, which was around 37% a year. From 1990 to now, the growth is still high, i.e. around 25%. In 1997-1998, when the political and economical crises “swept” Asia mainly Indonesia, Republic of Korea, and Thailand, the coal sector was affected seriously. Some companies have to reduce their consumption of coal. As can be seen in Table 3, the coal production growth in Indonesia was still positive. This means that the demand of the coal sectors is still on positive growth. On the other hand, coal price has been on the decline since the last three years (coal price for long-term contract: from US\$ 40/ton (1997) to be around 29 US\$/ton currently and for spot: from 29 US\$ to be around 24 US\$/ton currently).

The forecast of coal production based on work Program and Budget of Companies is shown in Table 3. It seems that several companies have ambitious expansion plans. The consideration of increase of the production is optimizing production cost.

## **Domestic Demand**

### **A Power Plant**

Since 1992, by Presidential Decree, private enterprises have been allowed to enter the Indonesian power market. An Independent Power Producer (IPP) could build its own power generation and must sell plant power only to state-owned electricity company (PLN). The coal-fired power plants have emerged their role (from 24.2% to 29.3% during 1995-1997 and will be 60% in 2010) to meet the national electricity demand as of the total electricity increase.

Until 1996, Indonesia's economy was growing at average rates of 7% annually. Electric power demand kept pace with this growth because economic development demanded increasingly electric power. The demand has grown around 14% annually for a decade. Then, since the economic crisis shocked Indonesia since the mid-1997, Indonesia's power industry has had to cope with a severe setback. Of totally 26 IPP projects, 10 IPP can continue the projects and 16 of them should be postponed. Actually, over the last 3 years, Suralaya, Bukit Asam, Sijantang and Paiton power station have increased their coal consumption as part of their build up to full capacity. Table 4 represents coal consumption of power stations.

## **A Cement Factory**

A next important user of Indonesian coal is the cement industry. Until 1997, there was increase in demand of cement production to meet the basic infrastructure projects of power plants, road, ports, and building. This condition was reflected by the strong economic growth of the country.

At present, there are eight cement factories, all which are facing a recent lower demand due to the economic crisis. However, since the new government is taking a rule, there is a new optimism of all people and companies that there will be significant growth in the industry. Cement companies have revised their production projection and awaited a more promising economic situation.

## **Other Industries**

This group includes pulp and paper, metallurgy, ceramics, and small industries. It is predicted in the future that this group together with the household sector will become very important coal users.

## **Indonesian Coal Export**

Indonesia coal export has increased from over 16 million tons in 1992 to at double in 1995 (31.5 million tons) and more than at tripled in 1999 (55 million tons). It is interesting to see that despite the current economic downturn during the period of 1997-1999 due to economical and political crisis, exports still continue to grow.

Indonesia coal markets are mainly in Asia-Pacific countries. In 1999, 63.5% of its coal exports went to East Asia (Japan, Republic of Korea, Chinese Taipei, Hong Kong, China) 11.6% to ASEAN countries, and 10.3% to Europe. Table 6A represents destinations of the Indonesian coal exports from 1995 to 1999.

In the Asia-Pacific market, Indonesia as the second largest coal exporter represented about 20% at the steam coal trade, while Australia is the largest supplier with about 45% share at the market (Monenco Agra - DOC, 1997). Indonesia's coal export in 2000-2003 is estimated to grow moderately (Table 6B).

It is predicted that in the following years the Indonesian coal export will continue to grow reasons are as follow:

- Indonesia's competitiveness in the export market (depreciation of rupiah versus dollar will generally increase the competitiveness), low mining cost (located near surface);
- environmentally good quality coal;
- government's strategy to encourage export-based industries;
- most Asian economies will recover their economic crisis faster than Indonesia which consequently brings the Asian thermal coal export market to recover faster and, therefore, need more coal from Indonesia;
- reliable supplier companies.

## **Supply-Demand Issues**

### **Transportation Infrastructure**

Development of coal infrastructure in Sumatra and Kalimantan is strategic. This is due to most coal producers are located in these areas. Some of them, especially CCoW Generation II and III, are situated in remote areas. Through the foreign assistance (Belgium and particularly NEDO of Japan), Indonesia has made coal transportation scenario study in the central part of Sumatra, South Sumatra, South Kalimantan, and currently still in the process of study in East Kalimantan and Central Kalimantan. The regional government, coal companies, or other investors to build the transportation infrastructure can use the result of this study. The development of transportation infrastructure will attract companies to develop their mines.

### **Coal Upgrading Technology**

Over 58% of Indonesia's coal is classified as a low-rank coal (lignite) with relatively high moisture content and low calorific values. In line with this issue, the coal upgrading technology has a strategic meaning to be developed. Presently, Japan through MITI has tested lignite samples from many areas to be upgraded (UBC and ACC processes, etc.)

### **Environmental Issue**

Regarding the Indonesian emission standard, it is stated in Decree No. 13 the Minister of Environment of March 7, 1995 that the emission of sulfur dioxide must be below 750 mg/m<sup>3</sup> by the year 2000. This will push down the allowable sulfur content of coal fuel for power plants to a level of 0.33% accordingly. Before that, the allowable emission of sulfur dioxide was 1500 mg/m<sup>3</sup>, equal to an allowable sulfur content of 0.66%. To meet the standard, the coal-fired power plants should install the de-SO<sub>x</sub> (FGD) system, which will consequently bring additional costs to investment and the maintenance of power plants.

This also means that the coal supplier should comply with the low sulfur contents. Therefore, the blending of coal by such contractors is essential to meet the required specification.

### **Coal Price**

At present, there is a tendency of oversupply of coal within the international market, which may influence the coal price. This has been indicated by dropping the price since last three years. At the domestic market, however, due to the falling down of rupiah versus dollar rates, the rate is as three times as that of rupiah; there is even the increase of coal price before the crisis. This has generated the attractiveness of coal producer to a domestic consumer.

### **Autonomy (Decentralization) Policy**

Indonesian government has issued the law of autonomy No22 and No25 in 1999, in which the main spirit of these laws is to give more autonomy right to the local (district) and provinces. This will bring among other the transfer of the authority in managing the mineral resources including coal from the central government to the local government. It is expected that by the new

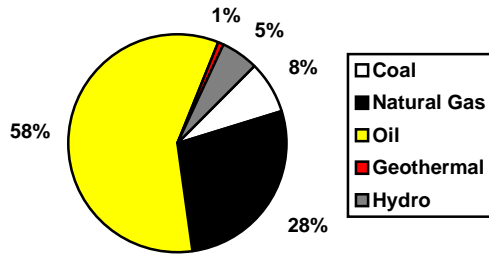
government's policy some issues related to land conflicts, environmental and production control could be effectively solved.

## **Closing Remark**

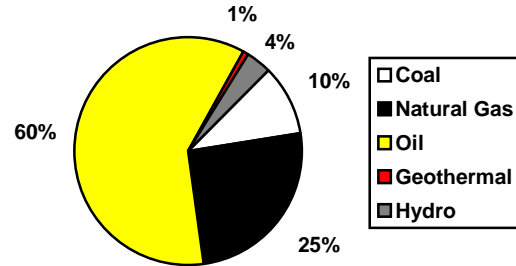
Despite the economic downturn in Indonesia, the coal sectors steadily remain to grow. Reliable coal producers with more serious approach to complete and good national coal policy will be significant supporters to this development.

## **References**

- ICMA-DOC, *Indonesian Coal Mining Development and Company Profiles*, 1998.  
Indonesian Coal Companies, *Monthly Company Reports on Coal Production and Sales*, 1997-1998.  
*Paper of One-Day ICMA Seminar*, Jakarta, 24 November 1998.  
Sunardi, RA, *Outlook for Indonesian Coal Exports*, Coaltrans 99 Conference, Hamburg, 1999.

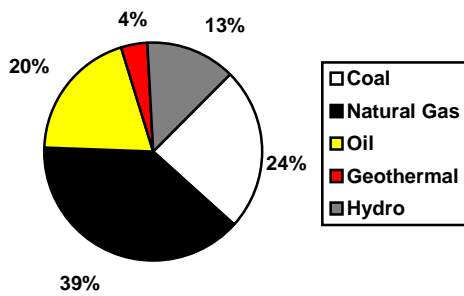


**Total 574,567 thousand BOE  
(FY 1998/1999)**

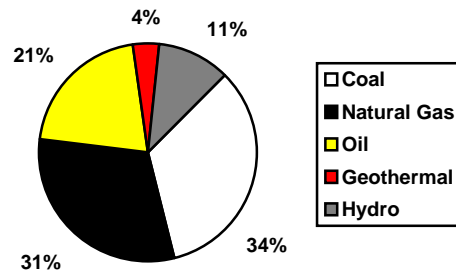


**Total 496,944 thousand BOE  
(FY 1995/1996)**

**Figure 1. Coal Contribution in Energy Mix**



**20,600 MW Total 94,558 thousand BOE  
(1995)**



**15,100 MW Total 127,007 thousand BOE  
(1998)**

**Figure 2. Coal Contribution to the Power  
Sector**

**Table 1. Status of Coal Contract of Work (as December 1999)**

Gen.	Year	P/A	G/S	Explor.	F/S	Const.	Prod.	Active	Termination	Total
I	1981-1990	-	-	-	-	-	10	10	1	11
II	1994	-	-	9	2	1	5	17	2	19
III	1997-1999	3 <sup>1)</sup>	60	30	2	-	-	95	15	110
IV	1999	28 <sup>2)</sup>	-	-	-	-	-	28	8	36
<b>Total</b>		<b>31</b>	<b>60</b>	<b>39</b>	<b>4</b>	<b>1</b>	<b>15</b>	<b>150</b>	<b>26</b>	<b>176</b>

Source: DOC, 2000

Note: 1)The Principle Agreement (3 Foreign Investment/PMA), waiting for signing the contract Generation III

2)The Principle Agreement of CCoW (25 Domestic Investment/PMDN), for Generation IV

**Table 2. Actual and Future Outlook of Coal Production, Domestic and Export**  
(million tons)

Year	Production	Domestic				Export
		Electricity	Cement	Others*	Total	
1999 (Actual)	73.6	12.4	3.0	3.0	18.4	552
2000	84.5	13.9	3.8	3.5	21.2	63.3
2001	96.1	17.7	4.4	3.8	25.9	70.2
2002	105.3	18.9	4.8	4.1	27.8	77.5
2003	109.6	20.1	5.4	4.4	29.9	79.7

\*) metallurgy, pulp industry, small industries, and so on.

**Table 3. Actual Coal Production and the Future Outlook until 2003**  
(thousand tons)

	Actual			Forecast			
	1997	1998	1999 (realization)	2000	2001	2002	2003
PTBA	9,965	9,859	11,207	13,200	14,100	15,000	16,000
CCoW Gen. I	40,604	45,297	53,946	62,000	69,800	75,100	76,400
CCoW Gen. II & III	-	1,194	3,648	3,900	6,700	9,700	11,700
Mining Authorization Unit	4,085	4,565	4,717	5,000	5,000	5,000	5,000
Cooperative Unit	171	273	129	400	500	500	500
Total Production	54,825	61,188	72,647	84,500	96,100	105,300	109,600

Source: Directorate of Coal, 2000; Company Work Program and Budget, 2000; PTBA, 199



**Table 4. Coal Consumption of Power Stations 1997-1999 and the Future Outlook (2003)**  
(thousand tons)

Power Stations	MW	Actual		Forecast			
		1998	1999	2000	2001	2002	2003
Paiton I (PLN)	800	2,063	2,196	2,351	2,635	2,900	3,200
Paiton I (IPP)	1,220	-	-	-	1,800	2,700	3,600
Suralaya	3,400	7,485	8,227	9,000	10,200	10,200	10,200
Bukit Asam	260	1,239	1,126	1,244	1,270	1,298	1,350
Ombilin	200	222	115	183	234	250	250
Sijantang	200	151	118	180	180	180	180
KPC	10	37	37	45	45	45	45
Freeport	130	383	625	625	650	650	650
Asam-asam	130	-	-	300	650	650	650
<b>TOTAL</b>		<b>11,580</b>	<b>12,444</b>	<b>13,928</b>	<b>17,664</b>	<b>18,873</b>	<b>20,125</b>

Source: DOC and company estimation, 1999-2000

**Table 5. Actual Coal Consumption for the Cement Sector and the Future Outlook up to 2003**

(thousand tons)

	CEMENT COMPANY	Actual			Forecast			
		1997	1998	1999*	2000	2001	2002	2003
1	PT SEMEN ANDALAS INDONESIA	132.6	123.9	26.5	170.6	170.6	212.9	212.9
2	PT SEMEN PADANG	461.2	421.0	583.7	727.2	727.2	756.7	795.2
3	PT SEMEN BATURAJA	56.9	58.0	58.0	71.3	106.9	142.5	142.5
4	PT INDOCEMENT	1,177.9	931.4	718.5	1,026.0	1,315.8	1,410.8	1,760.6
5	PT SEMEN CIBINONG	313.3	243.5	426.6	485.4	500.2	513.0	551.5
6	PT SEMEN GRESIK	431.3	357.8	701.4	783.8	926.3	997.5	1,068.8
7	PT SEMEN TONASA	412.2	412.2	489.1	712.5	755.3	755.3	798.0
8	PT SEMEN KUPANG	15.9	3.5	-	33.0	33.3	34.0	34.0
<b>TOTAL</b>		<b>3,001.3</b>	<b>2,551.3</b>	<b>3,003.8</b>	<b>4,009.8</b>	<b>4,535.6</b>	<b>4,822.7</b>	<b>5,363.5</b>

\* Temporary Source: Cement Association of Indonesia, 1998; Cement Factory, 2000; DOC estimation, 2000

**Table 6A. Indonesian Coal Export by Destination**

(thousand tons)

<b>Destination</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
<b>East Asia</b>	<b>24,045</b>	<b>29,380</b>	<b>34,508</b>
J a p a n	10,856	11,622	12,957
Republic of Korea	3,479	4,746	5,308
Chinese Taipei	7,364	10,038	13,554
Hong Kong, China	2,346	2,974	2,689
<b>ASEAN</b>	<b>6,269</b>	<b>4,217</b>	<b>6,668</b>
Philippines	2,018	2,293	2,800
Malaysia	1,521	925	1,952
Thailand	2,730	999	1,916
<b>Europe</b>	<b>5,639</b>	<b>6,097</b>	<b>5,527</b>
Spain	2,025	3,189	2,872
Netherlands	2,868	2,765	2,041
Germany	342	33	101
Denmark	307	0	0
United Kingdom	38	0	125
Italy	0	66	370
Ireland	59	44	18
<b>Others</b>	<b>5,774</b>	<b>6,922</b>	<b>8,478</b>
US	1,281	1,225	1,098
India	1,573	2,140	2,308
Others	2,920	3,557	5,072
<b>Total</b>	<b>41,727</b>	<b>46,616</b>	<b>55,181</b>

Source: Directorate of Coal, 2000

**Table 6B. Indonesia Coal Export (Actual and Future Prospect)**

(million tons)

<b>Nc</b>	<b>Export Destination</b>	<b>1999 (Actual)</b>	<b>2003</b>
1	East Asia	34.5	50.5
2	ASEAN	6.7	8.5
3	Europe	5.5	8.0
4	Others	8.5	12.7
<b>TOTAL</b>		<b>55.2</b>	<b>77.9</b>